

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

1. **Objection to Claims 8-10.**

Claims 7-10 were objected to because of the following informalities indicated by the Examiner: In claim 7, line 7, the word "to" should be inserted after the word "relating"; and in claims 8-10, the word "second" should be changed to "secondary".

In response, the Applicant has amended Claims 7, 8 and 10 as indicated by the Examiner. No amendment of Claim 9 was found to be necessary.

2. **Rejection of Claims under 35 U.S.C. §102.**

Claims 1-13 were rejected under 35 U.S.C. §102(b) as being anticipated by WO 01/20198 A1 (Van Doorne). In support of the rejection, the Examiner states:

"WO discloses a control system for a continuously variable transmission having a programmable controller (17-19), means associated with the controller for mapping rate of change of ratio to clamping pressure between the pulleys of the CVT (clms 3-5, Figure 4 (algorithm or map), a hydraulic servo control system (15, 16, 20, 21) controlled by the controller and controlling clamping pressure of the CVT, achieving a desired rate of change in ratio of the CVT (ROC), achieving a commanded clamping pressure (Pf, Ps) in response to an input torque (Tp) and a commanded ratio rate (RC) based on a mapping of empirical data pertaining to pressure (cylinder pressure), ratio rate (pulley ratio) and torque (transmission torque), controlling the ratio rate and clamping pressure based on a ratio map (mapping of ratio rate above), and transmitting a given amount of torque (Tt) according to the map (Figure 4)."

Claims 1-4 and 13 were rejected under 35 U.S.C. §102(b) as being anticipated by Ito (U.S. No. 4,565,110). In support of the rejection, the Examiner states:

"Ito discloses a control system for a continuously variable transmission having a programmable controller (60), means associated with the controller for mapping rate of change of ratio to clamping pressure between the pulleys of the CVT (Figure 7), a hydraulic servo control system (56) controlled by the controller and controlling clamping pressure of the CVT."

Claims 1-4 and 7-13 were rejected under 35 U.S.C. §102(b) as being anticipated by Abo et al (U.S. No. 6,243,638). In support of the rejection, the Examiner states:

"Abo et al discloses a control system for a continuously variable transmission having a programmable controller (12, 13, 16, 18), means associated with the controller for mapping rate of change of ratio to clamping pressure between the

pulleys of the CVT (14 with 11 and 17), a hydraulic servo control system (4-7) controlled by the controller and controlling clamping pressure of the CVT, achieving a commanded clamping pressure in response to an input torque and a commanded ratio rate based on a mapping of empirical data pertaining to pressure, ratio rate and torque (11 and 17), controlling the ratio rate and clamping pressure based on a ratio map (mapping of ratio rate above), and transmitting a given amount of torque (11 and 17) according to the map."

After carefully reviewing the grounds for rejection and the references cited by the Examiner, the Applicant has amended each of independent Claims 1, 3, 5, 7, 9, 11 and 13 to recite an aspect of the Applicant's invention that is not taught by the cited references. More specifically, the Applicant has amended each of those claims to recite that acceleration and deceleration of the vehicle is dynamically controlled by controlling rate of change of ratio. This aspect of the invention was previously recited only in independent Claims 14, 16, 18, 20, 22, 24 and 26 (which are subject to rejection under 35 U.S.C. § 103 as discussed below). None of the references cited in support of the rejection under 35 U.S.C. § 102(b), however, teach mapping rate of change of ratio to clamping pressure and/or differential pressure between pulleys in a CVT and dynamically controlling acceleration and deceleration directly from rate of change of ratio. Therefore, the Applicant respectfully requests that the rejection of Claims 1-13 under 35 U.S.C. §102(b) be withdrawn.

3. Rejection of Claims 14-26 under 35 U.S.C. §103.

Claims 14-26 are rejected under 35 U.S.C. 103(a) as being obvious in view of the combined teachings of Frank (U.S. No. 6,054,844) and WO 01/20198 A1. In support of the rejection, the Examiner states:

"Frank discloses a hybrid electric vehicle having a continuously variable transmission (18), an internal combustion engine (10) coupled to the CVT, an electric motor (24) coupled to an output of the engine, a system controller (30) controlling the motor, engine and rate of change of ratio of the CVT varying an acceleration (via 32) and deceleration (via 34) by varying motor torque (42) and rate of change of ratio (44), but does not disclose mapping a rate of change of ratio to clamping pressure and the remaining limitations used for this in claims 1-13.

WO discloses a control system for a continuously variable transmission having a programmable controller (17-19) and means associated with the controller for

mapping rate of change of ratio to clamping pressure between the pulleys of the CVT and the remaining limitations of claims 1-13 as disclosed above.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide Frank with a mapping rate of change ratio to clamping pressure in view of WO to prevent slipping of the drive belt.

In response, the Applicant respectfully submits that the cited combination does not render the subject matter of Claims 14-26 obvious because there is no suggestion, teaching, motivation, or incentive for mapping rate of change of ratio to clamping pressure and/or differential pressure between pulleys in said CVT and dynamically controlling acceleration and deceleration of the vehicle directly from the rate of change of ratio.

As noted by the Examiner, the Frank '844 reference teaches using the rate of change of ratio to vary acceleration and deceleration of a vehicle. However, Frank does not teach how to measure or control the rate of change of ratio. Furthermore, this lack of teaching is not supplied by the Van Doorne WO '198 reference, because there is no teaching therein of how to measure or control rate of change of ratio. To the contrary, WO '198 teaches only a pressure control system to provide a minimum pressure - rate of change of ratio is not controlled.

Neither Frank '844 nor WO '198 teach, suggest or provide motivation or incentive for measuring and controlling the rate of change of ratio to dynamically control the acceleration or deceleration of the vehicle as recited in the Applicant's claims. Instead, the cited references try to calculate or measure the rate of change of ratio for the purposes of keeping the dynamics from being undesirable. While the cited references are trying to keep the rate of change of ratio from getting too large or too small, none of them control rate of change of ratio to dynamically control acceleration or deceleration directly as is recited in Claims 14-26 (as well as amended Claims 1-13). The Applicant is using maps of pressure and ratio to measure the ratio rate so that the Applicant can control dynamically control the acceleration and deceleration of the vehicle directly from the ratio rate (Claims 1-13) and directly from the ratio rate and torque (Claims 14-26). The cited combination does not teach, suggest, or provide motivation or incentive for those aspects of the Applicant's claims.

Nor do any of the references cited by the Examiner in support of the rejection of Claims 1-13 under 35 U.S.C. §102(b) provide any teaching, suggestion, motivation or incentive for the foregoing aspects of the Applicant's claims when combined with either or both of the references cited by the Examiner in support of the rejection of §103. For example, Abo et al. (U.S. No. 6,243,638) teaches a servo hydraulic system but does not control rate of change of ratio directly to affect vehicle control. Abo et al. uses a target ratio for ratio control then it checks to see that the ratio rate is not too high or low. Ratio rate is not used for control. Instead, ratio rate is measured by maps to ensure it is not too high or too low. Ito (U.S. No. 4,565,110) states in his Abstract that "the rate of changing speed ratios -- is consecutively varied." This is completely different than continuous ratio rate control resulting from the Applicant's dynamic control. While Ito uses a method of keeping the rate of change of ratio from being too large using hydraulic valves and small orifices, Ito does not provide for direct dynamic control.

Nor do the other references of record provide any requisite teaching, suggestion, motivation or incentive. Niwa et al. (U.S. No. 4,584,907) uses rate of change of ratio "to permit rapid acceleration of the vehicle when needed" ... "as well as fuel consumption efficiency." However, Niwa et al. are not using the rate of change of ratio for control. Instead, they are merely controlling rate of change of ratio to prevent undesirable dynamics and to provide rapid acceleration of the vehicle. Taniguchi et al. (U.S. No. 6,459,978) controls the ratio of the CVT but for "reducing a rate of change in the speed ratio during downshifting, restricting upshifting of the CVT". In essence, what Taniguchi et al. are doing is controlling the rate of change in the speed ratio to prevent negative dynamic effects of the CVT. However, all Taniguchi et al. can achieve with their system is to "reduce" or "restrict" rate of change of ratio. Therefore, neither of these references provide for dynamic control of the acceleration or deceleration of the vehicle.

As can be clearly seen, the Applicant's claims are directed to measuring and controlling rate of change of ratio to provide for dynamic control of vehicle acceleration and deceleration directly from rate of change of ratio. The combination of measurement and control in the manner recited the Applicant's claims is has not been taught and is not rendered obvious by the cited references. Accordingly, the rejection under 35 U.S.C. §103 should be withdrawn.

4. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, the Applicant has made these amendments in order to expedite allowance of the currently pending subject matter. However, the Applicant does not acquiesce in the original ground for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments. The Applicant reserves the right to pursue the original scope of these claims in the future, such as through continuation practice, for example.

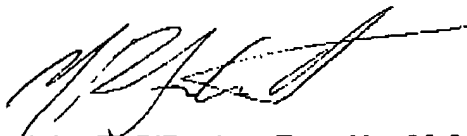
5. Conclusion.

Based on the foregoing, the Applicant respectfully requests that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, the Applicant respectfully requests that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

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Respectfully submitted,



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